

FECAL EGG COUNTING (FEC)

Quantitative fecal analysis determines the specific number of parasite eggs per gram (EPG) of feces through a controlled sampling procedure. This is different than a qualitative test which simply identifies whether parasite eggs are present and what types there are (roundworm, tapeworm, and coccidia eggs are easy to tell apart from each other).

Basic Quantitative Analysis for small ruminants – start with known quantities of feces and flotation solution.

Supplies:

1. fecal sample – 2 to 4 grams obtained directly from the rectum of the animal and kept chilled or refrigerated to keep the parasite eggs from hatching.
2. tongue depressors, applicator sticks or popsicle sticks to mash up feces
3. gram scale or a one-foot ruler, pencil, and nickel to weigh out the feces with – *balance the ruler like a teeter totter by placing it perpendicular on the pencil right at the ruler's middle (usually right at 6 inches). A nickel weighs about 5 grams so place the nickel 4 inches away from the center of the ruler (at about 2 inches) and then balance your feces 5 inches on the other side of the ruler (at about 11 inches) to get 4 grams of feces.*
4. 100 ml beaker or other container marked at 5 ml increments
5. flotation solution
6. 1 cc syringes (3 cc livestock syringes will do in a pinch)
7. Advanced Equine egg counting chamber ("McMaster Slide")
8. Microscope
9. *If you plan on shaking sample by hand –*
Leak proof plastic jar with screw top that can hold up to 80 ml of liquid easily
10. *If you plan on shaking sample mechanically –*
Magnetic stir plate and 1.25 in. magnetic stir bar

Flotation solutions:

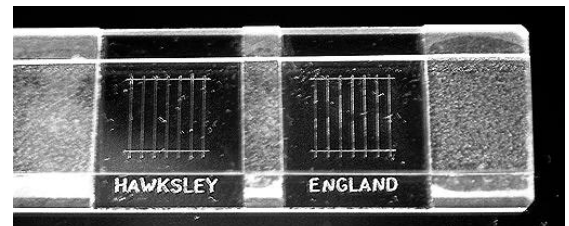
1. Epsom salts (Magnesium sulfate) – dissolve 400 g in 1 liter of water **OR**
2. Granulated sugar – dissolve 1 lb (454 g) in 355 ml of hot water

McMaster slide:

The egg counting chambers or "McMaster slide" can be ordered from Chalex Corporation (formerly advanced Equine Products), 5004-228th Ave SE, Issaquah, WA 98029, (1-425-391-1169, Fax 425-391-6669, email: chalexcorp@att.net, <http://WWW.VETSLIDES.COM>) The volume under each grid for this chamber is 0.15 ml. Counting chambers come with either etched or green grids. The etched grids are cheaper but are harder to see than the higher contrast green grids.

Microscope:

Ideally, you need a compound microscope with a 10X eyepiece and 10X lenses (it will also have 4X and 40X lenses) with an internal light source. Reconditioned microscopes work fine and can be ordered on the web from places like Associated Microscope (1-800-476-3893, <http://www.associatedmicroscope.com/>) or obtained from high schools or colleges that have not turned in older microscopes yet for reconditioning.



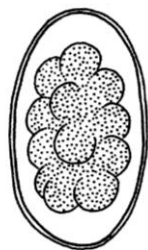
Magnetic stirrer:

Refurbished magnetic stirrers are also available on the web. One source is Medical Resources USA (1- 800 330-3591, <http://www.medicalresources.com/>)

Procedure:

1. Using a tongue depressor, weigh out 2 to 4 gm of feces into beaker.
2. Break up the fecal pellets and add the correct amount of flotation solution to the feces to make a slurry. You'll need a total of 56 ml flotation solution for 4 g of feces, 42 mls for 3 g or 28 ml for 2 gm. **It is easiest to add just a little of your flotation solution to first break up the fecal pellets and then add the remainder of the solution.** For example, for 4 g of feces, you can add about 20 ml flotation solution to help break up the feces using the tongue depressor to break lumps. Then bring the slurry up to the 60 ml mark on your beaker using the remainder of your flotation solution. **. If you do not have a scale, keep in mind that a gram of feces is approximately 1 ml in volume. Thus, you can put 28 mls of solution into a beaker and then add enough feces to bring the liquid level to 30 mls, etc.**
3. Add a stir bar, and stir on a magnetic stirrer at medium speed for 5 min. **OR** put in a leakproof jar and shake vigorously for 5 minutes.
4. At the end of 5 minutes, while mixture is still stirring, draw about 1 ml fecal suspension from the upper layers of the slurry into your syringe.
5. Load one side of counting chamber carefully to avoid producing bubbles – each chamber holds about .15 ml of slurry and repeat sampling and loading procedure for second side of chamber.
6. Let preparation stand a minimum of 5 min (examine it at least by 20 min.)
7. Place chamber on microscope and examine with 10 X objective (Adjust the focus until you can see grid lines clearly and then refine your focus to the air bubble layer).
8. Count eggs in both sides of chamber- each chamber or grid has six sections. Do not count eggs outside the grid. Calculate the number of eggs per gram of feces: (side 1 + side 2) X 50

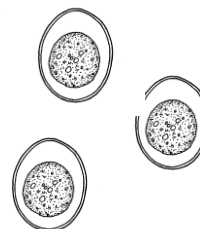
Notes: Fecal egg counts are a useful measure of potential pasture contamination. They are not necessarily correlated to worm numbers or to the severity of parasitic disease. Paired samples from the same animals before and after (7-10 days) deworming will help determine the effectiveness of an anthelmintic treatment. Failure to achieve at least 90 percent reduction of fecal egg counts is suggestive of worm resistance. Severe resistance is present when egg count reduction is less than 60 percent. When doing fecal egg counts, keep in mind that cat, dog, sheep, or goat feces, which contain a lot of clay-like fine particulate matter, may need more dilution than horse or cow feces that contain coarser particulates.



Strongyle eggs



Tapeworm egg



Coccidia eggs

Langston University method of preparing fecals for egg counting

Equipment needed

Fresh feces stored up to 7 days in refrigerator (do not freeze). You can mash pellets together and squeeze all the air out of the ziplock bag and they will store better.

30 cc syringe

3 cc syringe with end cut off

Popsicle stick or tongue depressor or spoon

Eye dropper or pipette or another small syringe (3 cc or less)

Flotation solution such as 1 ¼ cups of sugar mixed into 1 cup of water

Small glass bowl (i.e. custard dish, salsa bowl)

Plastic tea strainer

McMaster slide, microscope, etc.

Procedure

1. Mash fecal pellets into the 3 cc syringe and form a solid column of feces. Push plunger to 2 cc mark and cut off. Push the 2 cc of feces into a tea strainer resting in the glass bowl.
2. Fill 30 cc syringe with 28 cc of flotation solution and add to the tea strainer in the glass bowl.
3. Use depressor or spoon to crush and break up feces into a slurry in the tea strainer. Finer particles and liquid will be pushed out into glass bowl.
4. Lift tea strainer out of bowl and discard the residue in it.
5. Stir solution in glass bowl 8 times and use an eye dropper, small syringe or pipette to fill one chamber of your “McMaster Slide”. Stir solution 8 times again and fill the other chamber. Let slide sit for 5 minutes before looking at it under your microscope.

